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CLEANUP

December 27, 2016

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Re: Portland Harbor Superfund Site Final Feasibility Study Dispute Decision

Dear Sirs:

This memorandum resolves three disputes related to EPA's final Feasibility Study ("Final FS") for the Portland Harbor Superfund Site. The disputes were initiated by several but not all Respondents to the administrative order on consent entitled *In the Matter of: Portland Harbor Superfund Site*, Administrative Settlement Agreement and Order on Consent for Remedial Investigation/Feasibility Study, U.S. EPA Docket Number CERCLA-10-2001-0240 (the "AOC") and dated October 23, 2001 [1]. Arkema, Inc., Chevron U.S.A., Inc., Evraz Inc., N.A. Gunderson L.L.C., NW Natural, TOC Holdings Co., and Union Pacific Railroad Company (collectively the "Lower Willamette Group" or "LWG"); Legacy Site Services ("LSS") the agent for Arkema, Inc.; and the Union Pacific Railroad ("UPRR") initiated the LWG, LSS, and UPRR disputes by letters of June 22, 2016. Specific responses to each issue raised in the disputes are included in Appendix A.

[1] The signatories to the RI/FS AOC include Atofina Chemical, Inc., Chevron USA, Inc., Gunderson, Inc., Northwest Gas, City of Portland, Port of Portland, Time Oil Co., Conoco Phillips Company (formerly Tosco Corporation), Union Pacific Company, and Oregon Steel Mills, Inc.

LWG requests the following determination:

1. EPA's June 2016 FS should not be used as the basis for a Record of Decision ("ROD") for the Portland Harbor Superfund Site.

2. The alternatives analysis in the LWG's 2012 FS provides an adequate basis for selecting a remedy at the Site.

3. LSS requests that EPA make several modifications to the Final FS as documented in its letter of dispute.

4. UPRR requests a determination that several elements of the Final FS fail to comply with the National Contingency Plan ("NCP"), 40 C.F.R. Part 300, and EPA's designation of principal threat waste ("PTW") at the Site.

By this memorandum I deny all relief requested in the June 22, 2016 letters of dispute. In so doing, I specifically determine that the EPA's FS is compliant with CERCLA and the NCP, and provides an appropriate basis for selecting a remedy in a ROD for the Portland Harbor Site.

## Context

The FS disputes arise from EPA's decision of January 4, 2016 to finalize the FS for the Portland Harbor Superfund Site and to relieve the LWG of its obligation to complete performance of the FS. By letter of January 19, 2016, LWG disputed EPA's decisions regarding the FS and requested that EPA withdraw its letter. This dispute was resolved by an agreement of February 4, 2016 (the "February 4 Agreement") whereby LWG and EPA agreed, in relevant part, as follows:

1. The EPA will finalize the FS.

2. The LWG AOC signatories may dispute the Final FS produced by the EPA by submitting their dispute within 14 days of publication of the Proposed Plan.

3. The AOC dispute process would proceed directly to a formal determination by the Director of the Region 10 Office of Environmental Cleanup.

4. LWG's dispute statement will be placed in the administrative record and the dispute process will be conducted consistent with requirements for public participation for the proposed remedy decisions under CERCLA, the NCP, and federal law.

The EPA and LWG also anticipated that the determination resolving the dispute would be issued simultaneously with EPA's remedy decision after considering all public comments along with the disputed issues.

Prior to making this determination, I have reviewed materials I have received from the LWG, LSS, UPRR, and the EPA Portland Harbor Team that responded to the LWG, LSS and UPRR dispute

positions. These materials have also been placed in the administrative record that supports this Decision and in the Portland Harbor ROD Administrative Record.

## Scope of Dispute

The materials submitted and relied upon in the disputes are voluminous. EPA's position paper (Appendix A) which includes the LWG, LSS, and UPRR dispute positions, identifies and responds to over 50 issues. As an initial matter, I will streamline the dispute issue by addressing what issues are within the scope of the FS dispute. The February 4 Agreement allowed the LWG signatories to dispute the "Final FS." Issues related to EPA's decisions made prior to issuance of the Final FS (including those that have been resolved through the AOC's dispute resolution process or those relating to changes between EPA' draft 2015 FS and the Final FS) and the Proposed Plan are outside the scope of the February 4 Agreement and not subject to dispute.

In addition, a decision to exclude such issues from dispute is consistent with the AOC. This conclusion is supported by at least two sections of the AOC. The first is Section XII (Final RI/FS, Proposed Plan, Public Comment, Record of Decision and Administrative Record) of the AOC. In this section EPA, appropriately, retained the responsibility for preparing and releasing the Proposed Plan and Record of Decision. The second is Section XVIII (Dispute Resolution) of the AOC. Paragraph 1 of this section expressly limits disputes to activities or deliverables required under the AOC, prohibits disputes not initiated within 14 days of the disputed EPA decision, and renders a dispute resolution decision final (not subject to further review). Thus, the issues not related to the 2016 FS are dismissed without further discussion.

## Discussion

The LWG, LSS and UPRR collectively dispute nearly every aspect of the Final FS. They frame the issues within the rubrics of EPA's failure to comply with CERCLA, the NCP, and relevant EPA guidance; EPA's use of inadequate technical methodologies resulting in unsupportable determinations; or EPA's reliance on flawed data or assumptions, or conversely failure to rely on the right data or assumptions. Thus, and by way of illustration, the EPA is faulted for concluding that certain alternatives are not protective of human health and the environment or compliant with ARARs; exaggerating site contaminant risk, including those posed by eating fish; failing to recognize that upstream sediments are naturally covering up risks posed by contaminated sediment within the Site; ignoring, conversely, the potential for recontamination from upstream sources of contamination; determining incorrectly the types and amounts of PTW within the Site; underestimating the short terms effects of dredging while over-estimating the long-term benefits of cleanup, including erroneous assumptions about location and volume of waste subject to potential remedial action; relying on erroneous cost assumptions and underestimating the cost of remedy implementation; and ignoring the effect of source controls undertaken under the oversight of the Oregon Department of Environmental Quality ("ODEQ").

EPA's response addresses the dispute issues by clarifying misplaced suppositions that underlie Disputants' position, or by articulating a disagreement regarding the application of best professional judgment, or a combination of the two. EPA's response demonstrates that the EPA considered the relevant facts and drew logical conclusions from those relevant facts. Disputants may and do disagree with those conclusions, but EPA's conclusions are rationally related to the relevant facts and the product

of analysis based upon the EPA's experience of addressing widespread contamination at other sediment sites and sound scientific principles. Below are specific references to issues raised by the Disputants and the EPA's response which are illustrative of the information that supports my conclusion.

The LWG frames its first issue as follows: "EPA's conclusions that certain alternatives are not protective or fail to comply with ARARs are based upon evaluations that are inconsistent with the approved remedial investigation and baseline risk assessments and fail to apply appropriate risk management principles." In its response to this issue, the EPA addresses several sub-issues (LWG Dispute Issues 1a through 1s), and identifies where the LWG is mistaken, and where and why the EPA appropriately used its best professional judgment in a manner supportive of this decision. Some examples of EPA's responses to LWG Dispute Issue 1 include the following:

1. The EPA's response to LWG Dispute Issue 1a, which, among other things, describes why alternatives B and D are protective of human health[2] but are not protective of the environment; and unlike the Baseline Ecological Risk Assessment (BERA), LWG's proposed Comprehensive Benthic Risk Approach was disapproved by the EPA on December 18, 2012.
2. The EPA's response to LWG Dispute Issue 1b, which, among other things, describes how the EPA's approach to managing benthic risk "honors" data and information developed during the Remedial Investigation/Feasibility Study ("RI/FS"), and intends to protect local benthic populations.
3. The EPA's response to LWG Dispute Issue 1c, which, among other things, describes how EPA used surface weighted average concentrations (SWAC) in the Final FS. This approach addressed issues raised by EPA's National Remedy Review Board and EPA's Contaminated Sediment Technical Advisory Group. In addition, the approach EPA used in the Final FS provides a more realistic approach in managing risk than the approach proposed by the LWG in that the EPA's approach is consistent with the exposure of smaller range fish species that reside within the Site and takes into consideration the range within the Site these fish likely use.
4. The EPA's response to LWG Dispute Issue 1d, which, among other things, notes, in response to a complaint of the EPA's inappropriate reliance on aggregated data, that the EPA aggregated the same data as the LWG did in the draft FS it submitted to EPA in 2012, further describes the use of SWACs for evaluating alternatives during the Final FS, describes the use of interim goals as part of EPA's evaluation of long-term effectiveness by comparing post-construction risks to residual risks left if PRGs are met, and explains how site-specific considerations were sensibly used to develop remedial actions levels (RALs) to evaluate residual risk and allows the EPA to evaluate different arrays of cleanup actions and discern the relative cost-effectiveness each provided in risk reduction as part of the Final FS alternative analysis.
5. The EPA's response to the LWG Dispute 1m, which, among other things, describes how the EPA identified contaminants of concern (COCs) for surface water, informs why the identified surface water COC determinations are consistent with the CERCLA and the NCP, and explains why maximum contaminant levels (MCLs) established under the Safe Drinking Water Act are applied to pore water (both groundwater and surface water within the Site are potential sources of drinking water and pore water is representative of the pathway between the two).
6. The EPA's response to the LWG dispute 1q, which, among other things, explains why the EPA evaluated alternatives to address river bank contamination in the Final FS. In its explanation, the EPA notes the obvious, that contaminated river banks may be the source of a continuing release of

[2] The Portland Harbor Superfund Site ROD notes that alternative B and D may not be protective of human health since certain ARARs they may not attain are developed to be protective of human health.

hazardous substances into the waterway which may exacerbate existing contamination and re-contaminate remediated areas if not addressed, and describes the role of the ODEQ in EPA's decision to evaluate river bank contamination. The EPA also notes that it retains the authority to evaluate source control efforts undertaken under the oversight of ODEQ and that the Memorandum of Understanding between EPA and ODEQ does not preclude the EPA from exercising its authority.

7. The EPA's response to LWG Dispute Issue 1r, which among other things, describes the EPA's evaluation of post-construction equilibrium, and explains why, based on sediment trap data indicative of upstream sediment inputs and source control efforts, the EPA does not believe that remediated sediments will be re-contaminated.

The LWG's second issue argues that "EPA's June 2016 FS continues to lack complete and transparent evaluation of the long and short-term effectiveness of the alternatives, as well as the degree to which implementation of those alternatives will reduce the toxicity, mobility, or volume of hazardous substances, including through treatment of material it has labeled [PTW]." In response to the second issue, the EPA identifies and responds to numerous sub-issues, and in its response EPA, again, demonstrates that the LWG is either mistaken or that the EPA appropriately used its best professional judgment to address technical issues. Examples of responses include:

1. The Final FS relies on the conceptual site model developed in the RI report (which is not a subject of the Final FS disputes and was developed by LWG) and the Final FS provides the appropriate level of information related to the extent of contamination for the purpose of identifying and evaluating remedial alternatives. In addition, the EPA notes that the *Contaminated Sediment Remediation Guidance for Hazardous Waste Sites* (2005), at pages 2-39 through 2-40, cautions against the use of models that cannot be calibrated and validated at the space and time scales associated with the questions the model must answer.
2. EPA also notes that the Disputants failed to develop, and have acknowledged their failure to develop, a calibrated and validated fate and transport model that could be used to evaluate post-clean up effectiveness of different remedial alternatives.
3. EPA explains how its alternative analysis was both qualitative and quantitative.
4. EPA describes the role of cost-effectiveness in a feasibility study as the development and inclusion of information in a feasibility study that supports a cost-effectiveness determination when the remedy is selected, and how the Final FS includes the required analysis that supports a later determination of cost-effectiveness.
5. EPA describes the approach used for evaluating contaminant reductions in surface water that would result from implementation of the alternative remedial approaches, and explains why the assumption to subtract out upriver and downtown sources of contamination when evaluating alternative performance on reducing surface water contaminant concentrations is reasonable for the purpose of evaluating the effectiveness of different remedial approaches on post-cleanup surface water concentrations.
6. EPA acknowledges releases of dredged materials will occur during cleanup, estimates the released amount will equal approximately 1% of the dredged materials, and persuasively explains that this estimate is based on information developed during Phase 2 of the Hudson River project, and assumes use of best management practices that were developed for Phase 2 of the Hudson River project.

The Disputants raise and EPA responds to several issues related to cost assumptions used during the alternatives analysis. EPA's response includes, among other things, the following:

1. An explanation that the Final FS cost estimates were developed consistent with EPA guidance, *see A Guide to Developing and Documenting Cost Estimates During the Feasibility* Study (July 2000), for the purpose of comparing remedial alternatives estimates and that the estimates EPA uses in the Final FS fit within the necessary +50 to -30 per cent range of actual costs.
2. EPA identifies cost components the Disputants believed were missing (e.g., multipliers that account for pre-design, initial condition assessment, and agency oversight, and the cost of water treatment associated with dredging).
3. EPA explains why economies of scale associated with a large cleanup likely result in lower assumed rates for certain categories of costs (e.g., contingencies, project management, project design, or the mobilization/demobilization cost multiplier).
4. EPA provides examples of when it used the same cost assumptions as those used to support the LWG 2012 draft FS (e.g., alternative specific costs for purchasing, installing and removing sheet pile walls as well as the unit cost allowance for environmental monitoring during offloading at a transload facility).
5. EPA explains the basis for assumptions that are relevant to cost and differ from those that the Disputants supported, e.g., dredging production rates, the discount rate used to calculate present value of the evaluated remedial alternatives, and the volume of PTW requiring treatment.

Each of the disputes raise issues related to EPA's treatment of PTW in the Final FS. The Disputants argue that EPA's approach to PTW is inconsistent with guidance because it designates as PTW areas with "relatively low concentrations of contaminants of concern" based primarily on EPA evaluation of risks posed by the consumption of fish caught at the Site, because it includes as PTW wastes that can be reliably contained, or because it incorrectly designates listed wastes. EPA responses on this subject articulate a well-reasoned application of professional judgment in its application of Site-specific considerations and relevant EPA guidance. EPA's responses include the following:

1. EPA notes the NCP at 40 C.F.R. § 300.430(a)(1)(iii)(B) specifies a preference for treating PTW whenever practical, and that the relevant EPA guidance, see, *A Guide to Principal Threat and Low-Level Threat Wastes* (Superfund Publication 9380.06FS, November 1991 at p. 2) provides that PTW "are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained or would present a significant risk to human health or the environment should exposure occur."
2. EPA interprets, consistent with EPA practice, the above quoted language to create two categories of PTW. The first includes highly toxic source materials. The second encompasses source materials that are highly mobile that generally cannot be reliably contained or would present significant risk to human health or the environment should exposure occur.
3. EPA explains that its site-specific determination of highly toxic PTW at the Site includes several individual contaminants -- PCBs, cPAHs, DDx, and dioxins/furans (2,3,7,8-TCDD, 2,3,7,8-TCDF, 1,2,3,7,8-PeCDD, 2,3,4,7,8-PeCDF, and 1,2,3,4,6,7,8-HxCDF) – that above specified concentrations in sediment pose a $1 \times 10^{-3}$ risk for cancer from eating fish caught within the Site and the toxicity values are based on information developed during the baseline human health risk assessment and its application of the food web model (FWM).

4. EPA evaluated several contaminants of concern for the purpose of determining whether they should be treated as PTW under the second prong of the PTW definition; and EPA made a site-specific determination that PTW also included non-aqueous phase liquid (NAPL) in the form of naphthalene associated with MGP waste and chlorobenzene, since naphthalene/MGP and chlorobenzene NAPL cannot be reliably contained or would present a significant risk to human health or the environment should exposure occur.

Last of all, I will address concerns related to remedy implementation. These concerns are not within the scope of the disputes at issue but appear important to the Disputants and suggest that the Disputants mistakenly concluded that the Final FS identified the areas of contamination that will be subject to remediation and how each area would be remediated.

The Final FS relies on a large body of information developed during the RI/FS which provides an appropriate basis for identifying and evaluating remedial alternatives. However, and as noted by the EPA in its dispute response, the relied upon information was not developed with the intent to direct remedy implementation actions. Instead, the EPA used the information to support remedy selection by developing remedial alternatives for evaluation pursuant to CERCLA and the NCP's remedy selection criteria. In so doing, EPA, based on the best available information, made assumptions about the location of contamination and how it would be addressed. There is nothing unusual about EPA's approach in this instance. In almost every remedial cleanup the information developed during the RI/FS is supplemented by information that is developed post-ROD through remedial design studies, pilot or treatability studies, and remedy implementation.

This decision is issued concurrent with the Portland Harbor Superfund Site ROD. The Portland Harbor ROD, particularly in Section 14, explains where and how the remedy will be implemented by identifying post-ROD data gathering and monitoring activities, and describing factors that will be relevant to remedy implementation. I anticipate that the parties who perform post-ROD cleanup work will be involved in the development of post-ROD data gathering plans, monitoring plans and remedy implementation strategy.

The ROD identifies three phases of monitoring – baseline and remedial design data collection, construction monitoring, and long-term monitoring. The baseline and remedial design data collection discussion is most relevant to remedy implementation. This data collection effort will include, for example, the collection of surface sediment, sub-surface sediment, river bank, surface water, sediment pore water, groundwater, and fish tissue samples. In addition, and during the same period, data will be collected to refine the understanding of the Site bathymetry, inform flood-rise monitoring, identify NAPL, and update EPA's understanding of reasonably anticipated future uses within and along the waterway and ensure that implemented remedies are consistent with these uses. This new information will inform the implementation of the Selected Remedy decision tree and may result in implementation of different remedial technologies in different footprints than those mapped in the Final FS.
For example, dredging and capping will be implemented in areas where the new information identifies exceedances of the RALs, and these areas may differ from those that were assumed to be dredged or capped in the Final FS.

The ROD recognizes that the Selected Remedy may need to be implemented in phases and/or work sequenced and identifies factors the EPA will consider to implement the remedy. These factors include, at a minimum, source control actions, recontamination potential, scope (size) of actions across the Site, impacts to river users and the community, seasonal weather impacts, fish windows, and the implementation approach proposed by parties who agree to implement the Selected Remedy. While no such decisions have been made, the Site may be divided into work areas for purposes of design and construction activities based on factors such as prioritization of significant source areas, logistics, efficiency, or other factors; and sequencing of cleanup work may consider factors such as potential impacts of upstream work on downstream areas, including but not limited to, the potential for resuspension of contaminants during construction, nature and extent of contamination, and integration of the cleanup actions into the overall Site remedy.

The ROD makes clear that the manner in which the Selected Remedy is implemented will be refined as additional information is developed during remedial design, is likely to differ from the assumptions used in the Final FS, and suggests that the implementation strategy will be flexible and practically based on the relevant information developed post-ROD.

In conclusion, for the above reasons, I deny all relief requested in the June 22, 2016 letters of dispute. In so doing, I specifically determine that the Final FS is compliant with CERCLA and the NCP, and provides an appropriate basis for selecting a remedy in a ROD for the Portland Harbor Site.

Sincerely,

Sheryl Bilbrey

Sheryl Bilbrey, Director
Office of Environmental Cleanup

Enclosure
Appendix A: EPA's Response to Dispute Issues